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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,202	09/19/2003	Subhadra Gupta		7167

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Attention: Thomas A. O'Rourke
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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,202

Applicant(s)

GUPTA ET AL

Examiner

Steven H. VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,11-14,17-21,23,24 and 31 is/are rejected.
- 7) ☒ Claim(s) 3,6-10,15,16,22 and 25-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-31, drawn to a sweeping linear magnetron, classified in class 204, subclass 298.2.
 - II. Claim 32, drawn to a film formed by a sweeping linear magnetron, classified in class 428, subclass 611+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the product as claimed can be made by another and materially different apparatus. In particular, a CVD apparatus can make the film. The reasoning for product by process claims is equally applicable to claim 32.

3. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985); M.P.E.P. § 2113.

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4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Thomas O'Rourke on June 20, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-31. Affirmation of this election must be made by applicant in replying to this Office action. Claim 32 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **25** (see page 9); **39** (see page 10); and **51A** (see page 11). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

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accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **68** (see Figures 4A & 4B) and **2A** and **2B** (see Figure 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

9. The disclosure is objected to because of the following informalities: "a the" on page 19 at line 13 needs corrected.

Appropriate correction is required.

Claim Objections

10. Claims 1-16, 18-23, 25-30, and 31 are objected to because of the following informalities: "one" should be "on " in claim 1 at line 18 and claim 18 at line 12 and claim 19 at line 18 and claim 20 at line 17 and claim 23 at line 18 and claim 31 at line 17. Claims 2-16 depend from

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claim 1 and contain all of the limitations of claim 1. Therefore, claims 2-16 are objected to for the same reasons as claim 1. Claims 21 and 22 depend from claim 20 and contain all of the limitations of claim 20. Therefore, claims 21 and 22 are objected to for the same reasons as claim 20. Claims 25-30 depend from claim 23 and contain all of the limitations of claim 23. Therefore, claims 25-30 are objected to for the same reasons as claim 23. Appropriate correction is required.

11. Claims 22 and 25-30 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 22 depends from claim 20 and is directed to a magnetron. All of the limitations presented in claim 22 are directed to how the target is sputtered (i.e. reactive mode) and contains no limitations regarding the magnetron. The limitations regarding the sputtered method do not provide any limitations regarding the magnetron. Similarly, claims 25-30 depend from claim 23 and are directed to a magnetron, yet claims 25-30 provide limitations only to the target material. The target material is not a part of the magnetron. The target material is a part of the apparatus in which the magnetron would operate. Thus, the target material provides no limitations to further limit the magnetron.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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13. Claims 10, 16, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

14. Claim 10 recites the limitation "said filler magnets" in line 1. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 16 depends from claim 10 and contains all of the limitations of claim 10.

Therefore, claim 16 is rejected for the same reasons as claim 10.

16. Claim 24 depends from claim 213, a non-existent claim. Thus, claim 24 is indefinite.

Double Patenting

17. Applicant is advised that should claim 1 be found allowable, claims 20, 23, and 31 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

18. While there are different words in the intended use, the structure of the sweeping linear magnetron remains the same for the cathode backing plate, drive housing, motor, and magnet pack. The other limitations such as the intended use (i.e. "for providing full-face target erosion resulting in non-reactive mode film uniformity" in claim 20; "for arc-free, highly uniform deposition of a dielectric film with a high deposition rate resulting in a minimal target poisoning" in claim 23; and "for improved step coverage of a dielectric film deposited by DC reactive sputtering" in claim 31) or the method limitations present in the product/apparatus claims (i.e. "said magnet pack being moved over a target material, said target material being sputtered within

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said vacuum chamber onto a substrate” in claims 1, 20, 23, and 31) do not provide patentable weight

Claim Rejections - 35 USC §§ 102 & 103

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claim 19 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,258,217 B1 to Richards et al. (Richards).

22. For claim 19, Applicant requires a target material uniformly eroded by a device.

Applicant then describes the device. Essentially, claim 19 is a product made by a particular device and the claim analysis is similar to that for a product by process claim.

23. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985); M.P.E.P. § 2113.

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24. Richards discloses a uniformly eroded sputtering target (col. 2, l. 54-56).

25. Claim 17 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,026,471 to Latz et al. (Latz).

26. For claim 17, Applicant requires an improved magnetron comprising a cathode backing plate attaching to a vacuum chamber wherein a plasma deposition process can occur; a magnet pack within a cut-out in the cathode backing plate adapted to move within the cut-out; a means to move the magnet pack within the cut-out; and a target material on a side of the cathode backing plate in the chamber with the magnet pack moving over the target material to alter a magnetic field created by the magnet pack.

27. Latz discloses a magnetron comprising a cathode backing plate (Figure 2), magnet pack (Figure 4) within a cutout that moves, a target, and means to move the magnet pack over the target material (col. 56-68).

28. Claim 19 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 5,026,471 to Latz et al. (Latz).

29. Claim 19 is described above. The target in Latz would inherently uniformly erode along the magnet field lines that pass through the target and hence, would result in a uniformly eroded target. The product by process analysis presented above with regards to Richards is applicable and will not be repeated for brevity.

30. Claims 1, 2, 4, 5, 11-13, 18, 20, 21, 23, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,026,471 to Latz et al. (Latz) in view of US 6,641,701 B1 to Tepman.

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31. For claim 1, 20, 23, and 31, Applicant requires a sweeping linear magnetron comprising a cathode backing plate having an exterior surface adapted to be attached to a vacuum chamber wherein a plasma deposition process with occur; a drive housing attached to the exterior surface of the cathode backing plate and positioned over a cut-out in the surface of the cathode backing plate; a motor held in the drive housing that drives a yoke positioned within the cut-out; and a magnet pack. The magnet pack is attached to the yoke and has first and second magnet mounting plates and a plurality of magnets between the plates. The magnets are one or more center magnets, one or more side magnets, and one or more end magnets wherein the center and side magnets each have first and second ends with a body between. The bodies of the center and side magnets do not contact each other. The end magnets extend past the ends of the center and side magnets. For claim 18, Applicant claims the magnet pack claimed in claims 1, 20, 23, and 31.

32. Latz discloses a moveable linear magnetron behind a cathode (col. 4, l. 56-68) comprising center magnets 46 and side magnets 45, and end magnets (the magnets on the curved portion of the magnetron in Figure 4). Inherently, the center and side magnets have a first and second end and a body therebetween. The center and side magnets do not touch each other (Figure 4). There is shown a single magnet mounting plate 48. The magnetron is moved and is behind a cathode backing plate in a cut-out section (Figure 2).

33. There is no disclosure of a second magnet mounting plate or the motor to be in a drive housing that drives a yoke.

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34. Tepman discloses a moving magnetron with several magnets and two magnet mounting plates (Figure 1). The benefit of the two magnet mounting plates is that it provides a better magnet securing system (col. 3, l. 28-43) and appears to be a conventional idea within the art.

35. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Latz to utilize two magnet mounting plates to better secure the magnets and to utilize a technique conventional within the art with a reasonable probability of success.

36. Regarding the motor, Tepman discloses a conventional motor assembly for moving a magnetron. The motor is within a housing (Figure 1).

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Latz to utilize the motor in a drive housing because of the desire to utilize conventional technology of the art with a reasonable probability of success.

38. For claim 2, Applicant requires the mounting plates to have at least one side edge and at least one end edge with the side magnets along the side edge and the end magnets along the end edge. Figure 4 of Latz shows the limitation whereby the magnets that are along the curve are the end magnets and the magnets along the straight side portion are the side magnets.

39. For claim 4, Applicant requires the end magnets to extend from one end of one side magnets to one end of a second side magnet. For claim 5, Applicant requires the end magnets to form an arc that extends from one end of a side magnet to another end of another side magnet. As can be seen from Figure 4, the end magnets curve around from one side magnet to another.

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40. For claim 11, Applicant requires the magnet pack to move linearly across a width of the target material. For claim 12, the magnet pack moves linearly across the length of the target material. The magnet is moved laterally and longitudinally in the cut-out area (col. 4, l. 34-38).

41. For claim 13, Applicant requires the motor to be a frequency motor. Tepman shows that the motor moves based upon a timing belt and hence, is a frequency motor.

42. For claim 21, Applicant requires the magnetron to provide a uniformity of +/- 3-5% over a 12"x12" area with a constant rate and uniformity enduring for a lifetime of the target. Because the magnetron appears to be the same as that claimed, the uniformity of the erosion for a target are inherent properties.

43. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,026,471 to Latz et al. (Latz) in view of US 6,641,701 B1 to Tepman as applied to claim 1 above, and further in view of US 6,322,679 B1 to De Bosscher et al. (De Bosscher).

44. For claim 14, Applicant requires the motor to be an air cylinder. Latz in view of Tepman is described above, but does not disclose the motor to be an air cylinder.

45. De Bosscher discloses that motors for moving magnetrons conventionally can comprise timing belts, hydraulic motors, or pneumatic motors as equivalents (col. 6, l. 38-52).

46. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize an air cylinder as the motor because of the desire to utilize an art recognized equivalent with a reasonable probability of success.

Allowable Subject Matter

47. Claims 3, 6-10, 15, and 16 would be allowable if written to overcome the claim objection presented above.

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48. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have a magnetron as claimed by Applicant in claims 3, 6, and 15.

49. US 5,865,970 to Stelter discloses a magnetron for sputtering that comprises outer magnets with filler magnets between the outer magnets, but there is no motivation to place the filler magnets within the magnetron structure of Latz. Even if such a modification were made, the modification would change the entire magnetic field generated by Latz and thus would not be obvious. The end magnets in Latz appear to have the same function as the side magnets and thus, there is no reason to believe that they act as a shunt. Tepman discloses providing cooling to the cut-out area, but there is no indication that cooling fins are on the magnet mounting plates. Providing cooling fins on the magnet mounting plates would require hindsight.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.


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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
June 21, 2005